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A Cost Analysis of egg Production in Alberta 1993

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**The Economics of
egg
Production
in Alberta**

1993

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Summary

- The average cost of production for the 1993 table egg survey was 80.5¢ per dozen eggs, down 1.8¢ from the 1992 survey.
- Decreases in pullet costs, feed costs, labour costs, and other miscellaneous expenses helped to offset increases in the capital costs.
- Returns in 1993 exceeded costs by 11.9¢ per dozen eggs. The average return to equity was 6.8% based on the total investment value of buildings, equipment, machinery, land and quota. Excluding the quota investment, the return to equity averaged 11.8%, virtually identical to the previous five year average of 11.9%. The average return to equity (excluding quota) in 1992 was 16.6%.
- Gross income decreased in 1993 compared with 1992 by 4.4¢ per dozen eggs while net income (return to equity) decreased by 2.7 cents per dozen.

Study Objective

- Table eggs in Alberta are priced by the Canadian Egg Marketing Agency (CEMA) using national estimates of production costs.
- Alberta Agriculture, along with the Alberta Egg Marketing Board, initiated a provincial cost study in 1983 to monitor the relation between the national cost and the provincial (Alberta) cost.
- The main objective of this study is to determine the cost of producing eggs in Alberta. The primary concern of the Production Economics Branch is to provide producers with information on the economics of egg production so that they can improve their productive efficiency.
- More specifically, the objectives of the study are:
 - to provide an account of the costs and economic conditions encountered in the production of commercial eggs in Alberta;
 - to analyze the present price efficiency in Alberta;
 - to provide the participating producers with a personal economic analysis for management purposes; and
 - to also provide data for Alberta Agriculture staff to use in extension education.

Study Procedure

- Two alternative methods are commonly used to estimate the economic well being of farm enterprises. Alternative A determines the return to family labour, including the operator labour input; alternative B determines the return to equity invested in each particular enterprise. Each method involves the estimation of one or another cost item (Table 1).
- In alternative A, the residual is return to family labour. An equity interest charge must be imputed in order to arrive at the total cost of production. The actual residual can then be measured in terms of dollars per hour of labour.
- In alternative B, the value of family labour must be imputed since there is usually no explicit market value attached to this input.

| TABLE 1: ALTERNATIVE METHODS OF ANALYSIS | |
|------------------------------------------|----------------------------|
| A. Labour | B. Capital |
| Gross Income | Gross Income |
| Variable Cost | Variable Cost |
| Feed | Feed |
| Other | Other |
| Hired Labour | Hired Labour |
| - - - | Family Labour (Imputed) |
| Capital Cost | Capital Cost |
| Rent | Rent |
| Depreciation | Depreciation |
| Paid Interest | Paid Interest |
| Equity Interest (Imputed) | - - - |
| Return to Family Labour | Return to Equity |

- In this study, the objective is to determine the percentage return to equity (alternative B). The imputed value of family labour is included in the variable costs.

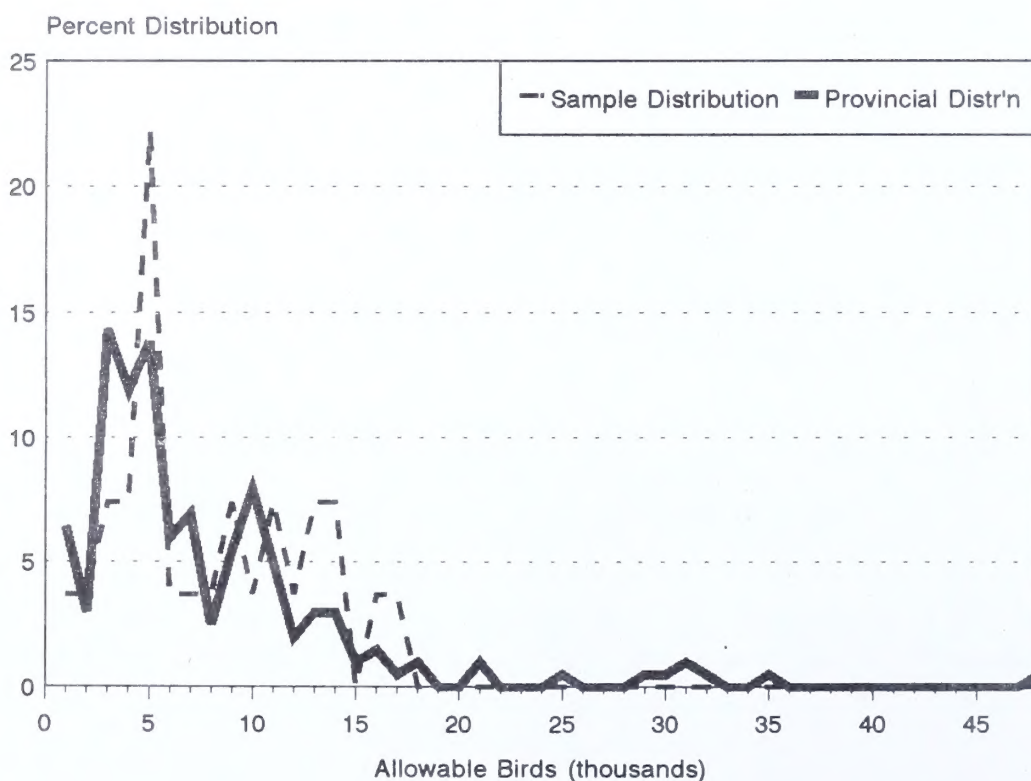
- The cost and return analyses in this study are based on enterprise analysis. The egg enterprise includes all activities associated with the laying operation.
- Expenses and income associated with each enterprise are allocated from the total farm activities. For example, utilities and fuel costs, which are purchased on a total farm basis, need to be allocated to the various farm enterprises. Since producers often have several enterprises on the same farm, allocating the appropriate costs to each enterprise can be difficult.
- In some cases the operator raises his own feed. This study did not attempt to estimate the production costs of crops (feed) which were used in the egg enterprise. Instead, it was assumed that the egg enterprise "buys" the crops from the crop enterprise at the average regional market price.
- Similarly, costs associated with home raised pullets were not considered in the layer operation; home raised pullets were assumed to be purchased at market prices.
- Grading costs (where reported) were excluded from the cost estimation.

Study Sample

- The study sample consisted of 27 producers, from a provincial total of 202 producers. One participant was excluded from the group average calculations because of incomplete data, leaving 26 in the study.
- The smallest table egg operation in the study was under 2000 birds while the largest was over 16,000 birds.
- The chart below shows that the study sample reflected the provincial distribution, except for the largest producers in the province.
- About 40 percent of producers in the province range in size from 2000 to 5000 birds. The sample had most representation in the 4000 to 5000 size interval (22%).
- Just under 30 percent of the total provincial producers range from 5000 to 10,000 birds, compared to the sample total of 22 percent.
- Five percent of the provincial producers house over 20,000 birds, whereas the study had no farms over 17,000.

Figure 1

**Table Egg Quota Frequency Distribution
Allowable Birds (Thousands)**



Summary of Results

- Table 2 lists the detailed costs and returns of the 26 producers in the study.

Income:

- The average gross income in 1993 was 92.4¢ per dozen eggs.
- The gross income received by producers is net of the Marketing Board Levy, which averaged 14.6¢ per dozen in 1993.
- The average retail sales price was 106.3¢ per dozen.

Variable Costs:

- Variable costs are made up of pullet costs, feed costs, labour costs and other non-capital cash expenses. These costs vary with the volume of production. In 1993, they averaged 68.5¢ per dozen.

Pullet Costs:

- Over 50 per cent of producers in the survey raise their own pullets while just under 50 per cent buy them.
- To directly compare all of the study participants, it was assumed that producers who raised pullets bought them at the average purchase price of the other producers. This compensates the actual pullet cost on the farm. The feed cost and other costs associated with raising pullets thus were not included in the layer operation.
- The average purchase price for pullets was \$3.64 per bird (15.6¢ per dozen).

Feed Costs:

- Just over 50 per cent of producers bought complete feed rations and the remainder used home grown grain mixed with supplement on the farm.
- For purchased feed, the actual cash value was taken, while for home grown feed, the estimated market value per tonne was applied to arrive at total feed cost.
- Feed costs averaged \$7.60 per bird, or 32.1¢ per dozen eggs.
- The average price of feed was \$183.67 per tonne. This is a blend price of complete feed as well as home grown grain. The purchased complete ration price alone, including a delivery charge, was higher.
- The average feed conversion was 1.76 kg per dozen, slightly higher than the 1.70 kg recorded in 1991.

TABLE EGG PRODUCTION COSTS AND RETURNS—1993
AVERAGE OF 26 FARMS

| | | | TOTAL | PER HEN \$ | PER DOZEN | % OF COSTS |
|-----------------------------------------------|-----------------|------------------------|----------|------------------|---------------|---------------|
| REVENUE: | | | | | | |
| 1. Egg Sales | 181,094 dozen | | 192,461 | 25.12 | 1.06 | |
| 2. Board Fees/Levies | | | (26,349) | -3.44 | -0.15 | |
| 3. Other Receipts | | | 1,170 | 0.15 | 0.01 | |
| A. GROSS INCOME | | | 167,282 | 21.84 | 0.92 | |
| OPERATING EXPENSES: | | | | | | |
| 1. Pullet Costs | 3.64 / pullet | | 28,273 | 3.69 | 0.16 | 19.4% |
| 2. Feed Costs | 183.67 / tonne | | 58,213 | 7.60 | 0.32 | 40.0% |
| CHICK & FEED COSTS | | | 86,486 | 11.29 | 0.48 | 59.4% |
| 3. Freight | | | 2,292 | 0.30 | 0.01 | |
| 4. Medication | | | 555 | 0.07 | 0.00 | |
| 5. Barn Supplies | | | 1,624 | 0.21 | 0.01 | |
| 6. Energy | | | 4,876 | 0.64 | 0.03 | |
| 7. Mach & Bldg Repairs | | | 2,916 | 0.38 | 0.02 | |
| 8. Paid Labour | 454 hours | | 4,040 | 0.53 | 0.02 | |
| 9. Interest — Operating Loans | | | 555 | 0.07 | 0.00 | |
| 10. Other Operating Costs | | | 3,057 | 0.40 | 0.02 | |
| OPERATING COSTS EXCL. CHICK & FEED | | | 19,916 | 2.60 | 0.11 | 13.7% |
| B. DIRECT CASH COSTS | | | 106,402 | 13.89 | 0.59 | 73.1% |
| UNPAID LABOUR: | | | | | | |
| 1. Operator Labour | 1,314 hours | | 11,590 | 1.51 | 0.06 | |
| 2. Family Labour | 1,020 hours | | 5,983 | 0.78 | 0.03 | |
| C. UNPAID LABOUR COSTS | | | 17,574 | 2.29 | 0.10 | 12.1% |
| D. TOTAL VARIABLE COSTS (B+C) | | | 123,976 | 16.18 | 0.68 | 85.1% |
| FIXED COSTS: | | | | | | |
| 1. Rent | | | 2 | 0.00 | 0.00 | |
| 2. Insurance & Taxes | | | 2,786 | 0.36 | 0.02 | |
| 3. Depreciation | | | 11,028 | 1.44 | 0.06 | |
| 4. Interest — Capital Loans | 7.85% | | 7,853 | 1.03 | 0.04 | |
| E. TOTAL FIXED COSTS | | | 21,669 | 2.83 | 0.12 | 14.9% |
| F. TOTAL PRODUCTION COSTS (D+E) | | | 145,644 | 19.01 | 0.80 | 100.0% |
| CASH COSTS (B+E-D.3) | | | 117,043 | 15.28 | 0.65 | |
| GROSS MARGIN or GROSS PROFIT (A-B-E+D.3) | | | 50,239 | 6.56 | 0.28 | |
| RETURN TO INVESTMENT (A-F+D.4) | 6.79 % | | 29,491 | 5.65 | 0.24 | |
| RETURN TO EQUITY & MANAGEMENT (A-F) | 6.47 % | | 21,637 | 2.82 | 0.12 | |
| INVESTMENT: | | | | | | |
| Buildings | 17.41 years | | 131,274 | 17.14 | 0.72 | |
| Machinery | 8.59 years | | 44,641 | 5.83 | 0.25 | |
| Land | | | 8,165 | 1.07 | 0.05 | |
| Quota | | | 250,474 | 32.70 | 1.38 | |
| G. TOTAL INVESTMENT | | | 434,553 | 56.72 | 2.40 | |
| MANAGEMENT | | | | | | |
| Years Farming | 16.04 years | Hours Per Bird | | | 0.364 hours | |
| Number of Flocks | 1.46 | Feed Conversion Factor | | | 1.76 kg/dozen | |
| Number of Layers | 7660.90 | Equity | | | 76.96 % | |
| Productivity Per Bird | 23.64 dozen/hen | Debt | | | 23.04 % | |
| Mortality | 5.24 % | Capital Turn Over | | | 2.60 years | |

Labour Costs:

- The cost of labour refers to actual work performed for a layer operation. When more than one enterprise was present on the farm, the working time for the table egg operation had to be estimated from total farm labour hours.
- Three types of labour are recognized in this study; operator, family unpaid labour, and hired labour. The cost of hired labour is the actual cash wages paid to hired workers.
- Since the operator and other family members are usually not paid, the value of their work has to be estimated at the cost of labour in the poultry industry. Operator and unpaid family labour rates used in the study were \$8.82 and \$5.87 per hour, respectively.
- Some studies use an arbitrary value for management, however in this report the management is rewarded by the bottom line return (return to equity).
- On average, 364 hours of labour were required for 1,000 birds per year. Smaller operations had larger labour needs per bird, which tended to inflate the group average. The total labour cost per dozen eggs was 11.9¢.
- Hired labour accounted for only 16.3 per cent of the total labour time for this sample, compared to 27.3 per cent for the 1992 sample.

Other Cash Expenses:

- This cost category consists of various items such as medication, barn supplies, energy, machinery and building repairs, freight, interest on operating loans and other expenses.
- These expenses accounted for 8.8¢ per dozen eggs. The largest component was energy costs, followed by machinery and building repairs.
- The operating interest of 0.3¢ per dozen is the actual cash outlay paid on outstanding operating loans during the year.

Capital Costs:

- The cost of capital is defined by the annual expenses associated with resource ownership; depreciation, interest payments, insurance, taxes and rent for capital assets.
- The cost of capital has to be borne regardless of whether production is taking place. The more volume produced for a given investment, the less significant unit capital cost becomes.

- The average capital cost was 10.9¢ per dozen eggs.
- Depreciation is based on the estimated market value. A depreciation rate of 5 per cent was applied to buildings and 10 per cent on machinery.
- The estimated current value of the investment in table egg enterprises was \$56.72 per bird. Excluding the investment in the quota, the investment amounted to \$24.02 per bird. On average, 23 per cent of the total investment was financed and the rest (77%) was owner's equity. Invested equity was \$18.49 per bird.

Total Costs:

- Total production costs were 80.5¢ per dozen eggs.

Returns:

- The return to equity is the final amount of revenue left after all expenses are subtracted from the gross income.
- Table egg farms in 1993 averaged \$2.82 return per bird. Average income of 92.4¢ per dozen exceeded average costs of 80.5¢ per dozen by 11.9¢. This represents an average return to equity of 6.5%. Excluding the investment in quota, the return to equity was 11.8%.
- A summary of the average costs, returns and investments for 1991 to 1993 is provided in Table 3 and Table 4, and is shown in Figure 2. Figure 3 shows production costs over the 1983 to 1993 period (actual costs and inflation adjusted).

Management Indicators:

- Average productivity within the sample was 23.6 dozen eggs per bird, substantially higher than 1992 average of 22.8 dozen per bird. This could be partly explained by a slightly longer production cycle.
- Feed, labour and capital efficiency are measured by feed conversion, hours per bird and capital turnover. The values achieved in 1993 for these resources were: 1.76 kg/dozen eggs, 0.364 hours per bird and 2.60 years of capital turnover (1.10 years excluding quota). The values for 1992 were 1.70, 0.360 and 1.13 (excluding quota), respectively.
- Another management indicator is flock mortality, which is expressed in terms of per cent loss from the layer quota number. The 1993 mortality was 5.24 per cent, compared with 4.48 in 1992.

TABLE 3: COSTS AND RETURNS SUMMARY

| | 1991 | 1992 | ¢ PER DOZEN EGGS | | | |
|---------------------------------------|-------|-------|------------------|---------------|-------------|--------------|
| | | | Total 26 | Smallest 8 | Middle 9 | Largest 9 |
| Blend Price | 109.7 | 111.7 | 106.3 | 109.4 | 103.8 | 106.8 |
| Other Receipts, Bird Salvage Value | 0.4 | 0.9 | 0.6 | 1.0 | 0.2 | 0.8 |
| Levy | -14.5 | -15.8 | -14.6 | -13.0 | -14.5 | -14.9 |
| Gross Income | 95.6 | 96.8 | 92.4 | 97.4 | 89.5 | 92.7 |
| Pullet Cost | 17.1 | 16.9 | 15.6 | 16.8 | 16.0 | 15.1 |
| Feed Cost | 35.4 | 32.7 | 32.1 | 38.5 | 30.7 | 31.4 |
| Other Cash Costs | 11.3 | 9.5 | 8.8 | 12.4 | 6.6 | 9.0 |
| Labour Cost | 11.4 | 12.7 | 11.9 | 23.5 | 11.2 | 9.7 |
| Capital Cost | 13.6 | 10.5 | 12.0 | 15.8 | 10.9 | 11.6 |
| Total Cost | 88.8 | 82.3 | 80.4 | 107.1 | 75.5 | 76.8 |
| Return to Equity (¢) | 6.7 | 14.6 | 11.9 | -9.8 | 14.0 | 15.9 |
| Return to Equity (%) | 8.7 | 16.6 | 11.8 | -6.5 | 13.0 | 18.2 |
| Including Quota | | | 6.5 | -4.5 | 7.0 | 9.4 |
| Profit Per Cent of Income (%) | 7.0 | 15.0 | 12.9 | -10.0 | 15.7 | 17.1 |

TABLE 4: INVESTMENT SUMMARY

| | 1991 | 1992 | \$ PER BIRD | | | |
|------------------------|-------|-------|-------------|---------------|-------------|--------------|
| | | | Total 26 | Smallest 8 | Middle 9 | Largest 9 |
| Total Investment | 26.81 | 24.90 | 24.03 | 34.58 | 25.42 | 20.78 |
| Including Quota | | | 56.72 | 67.14 | 58.22 | 53.45 |
| Debt | 9.73 | 4.94 | 13.07 | 17.24 | 10.84 | 13.23 |
| Equity | 17.08 | 19.97 | 43.66 | 49.90 | 47.38 | 40.23 |
| Paid Interest Rate (%) | 9.2 | 8.8 | 7.8 | 6.6 | 7.4 | 8.4 |

Figure 2

**Costs and Returns
1991 to 1993**

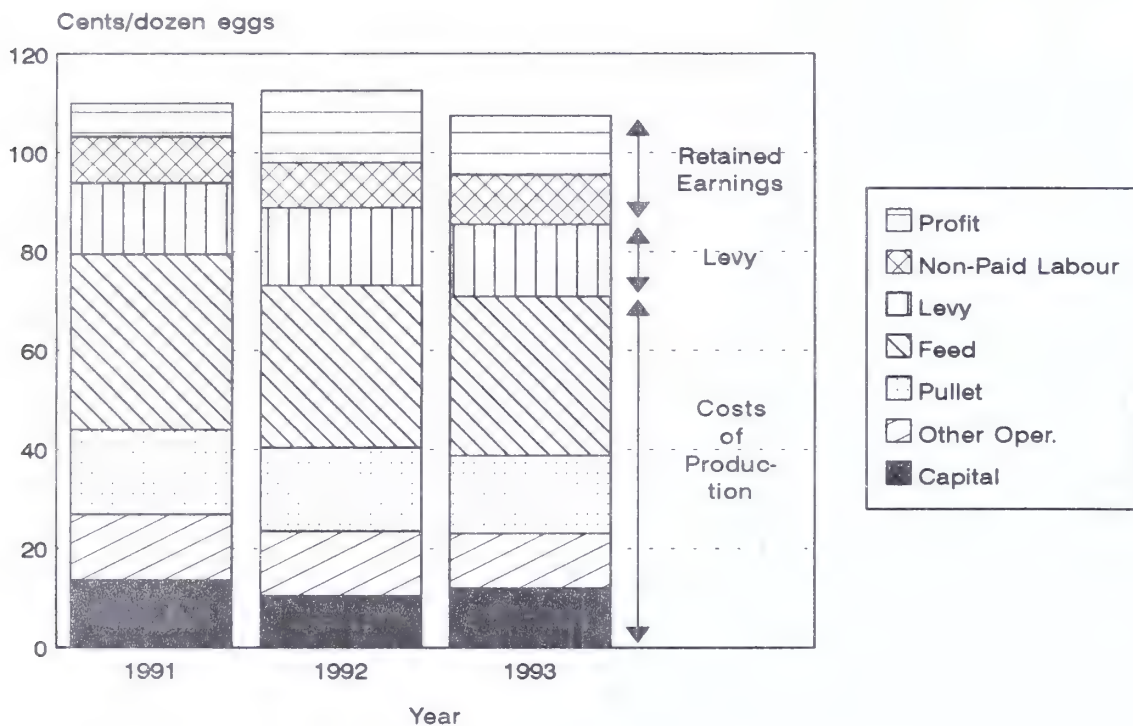
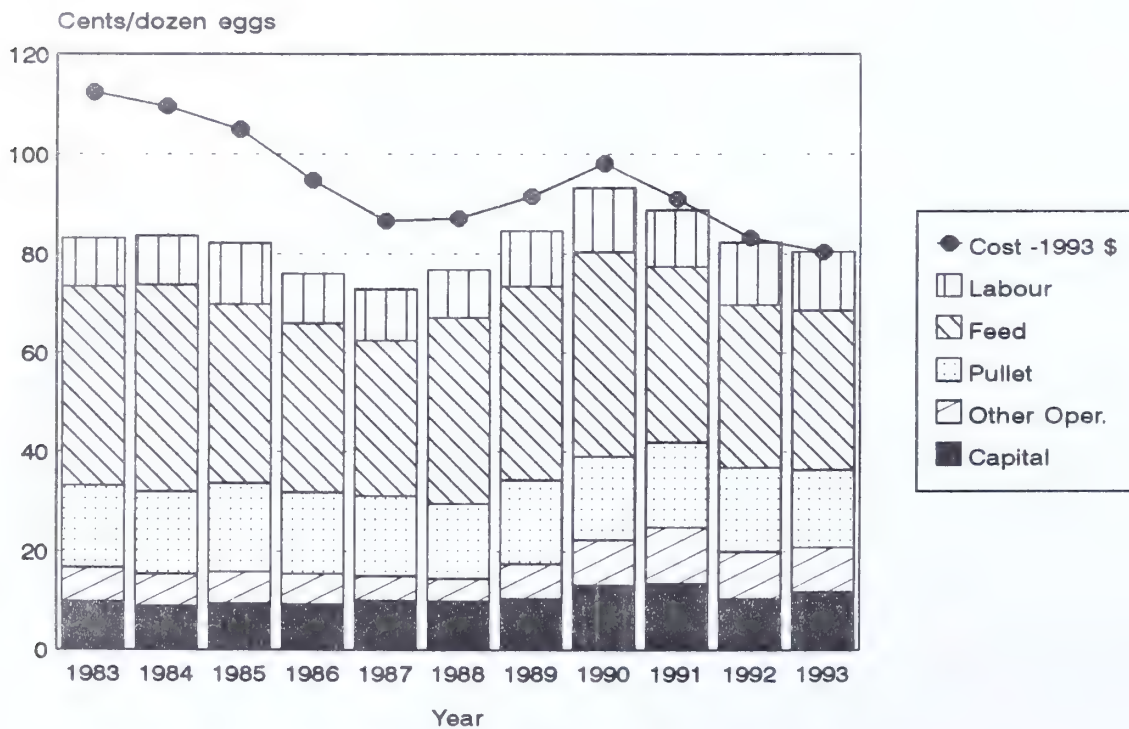


Figure 3

**Production Costs - Historical and Inflation Adjusted
1983 to 1993**



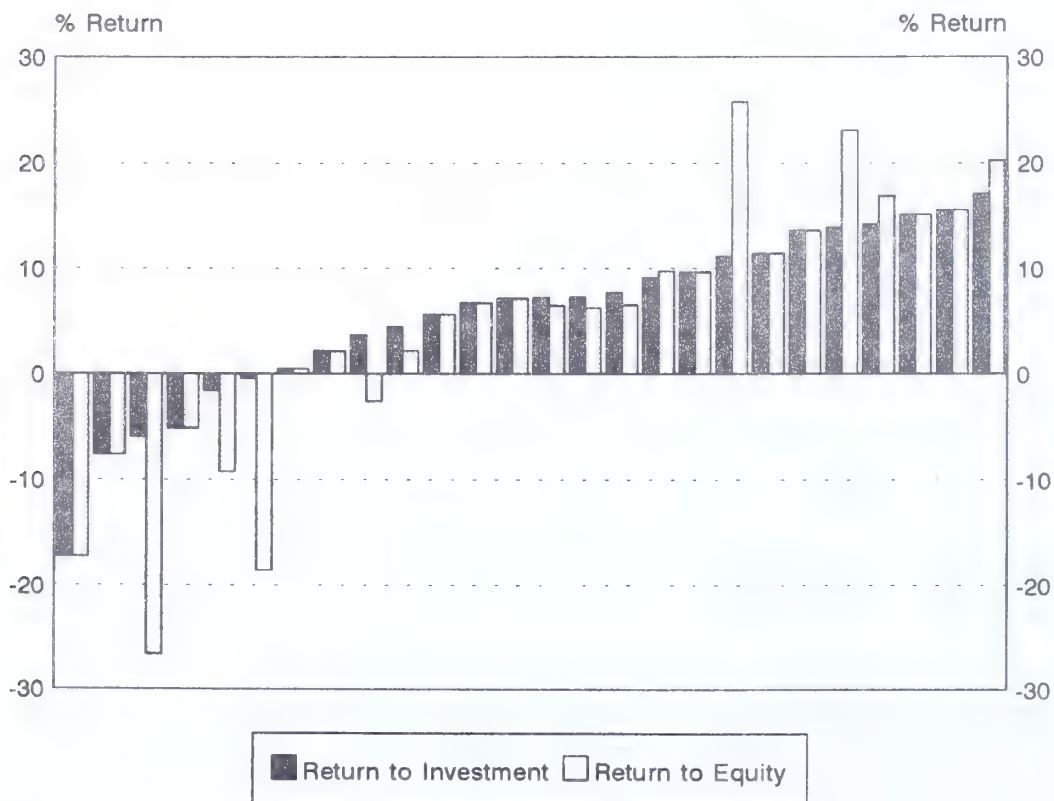
Trend Analysis

- This section presents 13 figures which show the distribution of results amongst study participants.
- Each figure compares two factors for the 26 participants (e.g., size of operation versus labour hours per bird). For instance, the first two bars in Figure 4 (dark and light) represent a) the return to investment and b) the return to equity for one producer; the second set of dark and light bars are the return to investment and return to equity for a second producer; etc.
- The first factor is ordered from lowest to highest from left to right. Its scale is read from the left-hand axis.
- The second factor's scale is read from the right-hand axis. The "shape" of the second factor provides an indication of how well the two factors are related. If some sort of relationship, or trend, can be detected, we can then speculate whether one of the factors directly affects the other factor.
- In some cases, the trend may appear to be contradictory to our "pre-conceived" notion as to the relationship between the two factors. Possible explanations are explored.
- The figures also provide an indication of the reliability of the data base. It is often difficult to estimate the allocation of shared resources to the table egg component of the farm. The figures illustrate possible outliers, or incorrect estimates.

Return to Investment Versus Return to Equity

- The return to investment illustrates the overall financial feasibility of the operation (before financing). The results range from about -17% to +17% in a relatively even distribution.
- Six of the 26 responses registered a negative return to investment. However, the imputed value of unpaid family labour has been factored into the estimate, therefore most of these individual producers will have recorded a positive cash flow.
- Return to equity is the financial performance of the producer's equity in the enterprise. It excludes the owed principal, but includes the financing cost (capital interest). The returns to equity range from about -26% to +26%.
- The figure shows the potential impact of "leveraging." If the enterprise has a positive return to investment, leveraging the operation by taking out a loan can have a positive impact on the producer's financial performance in terms of return to equity. If the return to investment is negative, then the opposite result occurs.

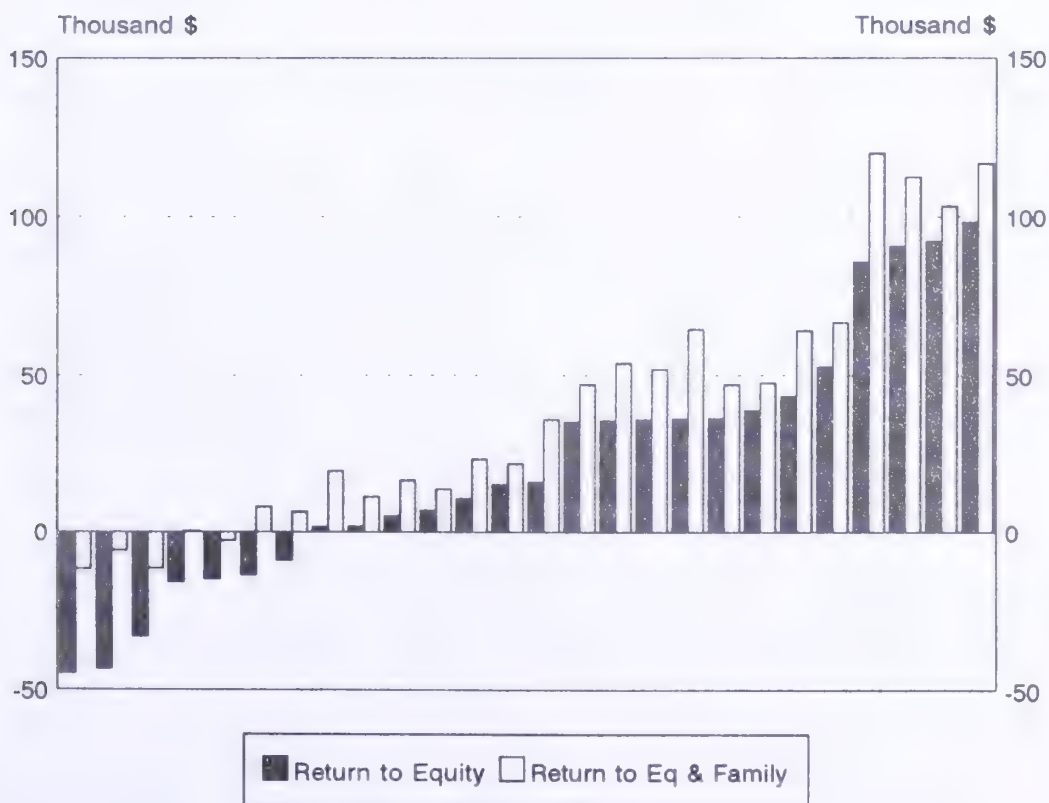
Figure 4 Return to Investment Vs. Return to Equity
1993



Return to Equity Versus Return to Equity+Family Labour

- This figure describes the economic returns in terms of thousand dollars for each operation instead of as a percentage of the invested dollars.
- The figure illustrates the effect of including the imputed unpaid family labour in the cost profile.
- The returns to equity range from -\$45,000 to 98,000.
- The returns to equity+family labour range from -\$10,000 to \$122,000.
- Only four operations record small negative returns to equity+family labour.

Figure 5 Return to Equity Vs. Return to Equity+Family Labour
1993

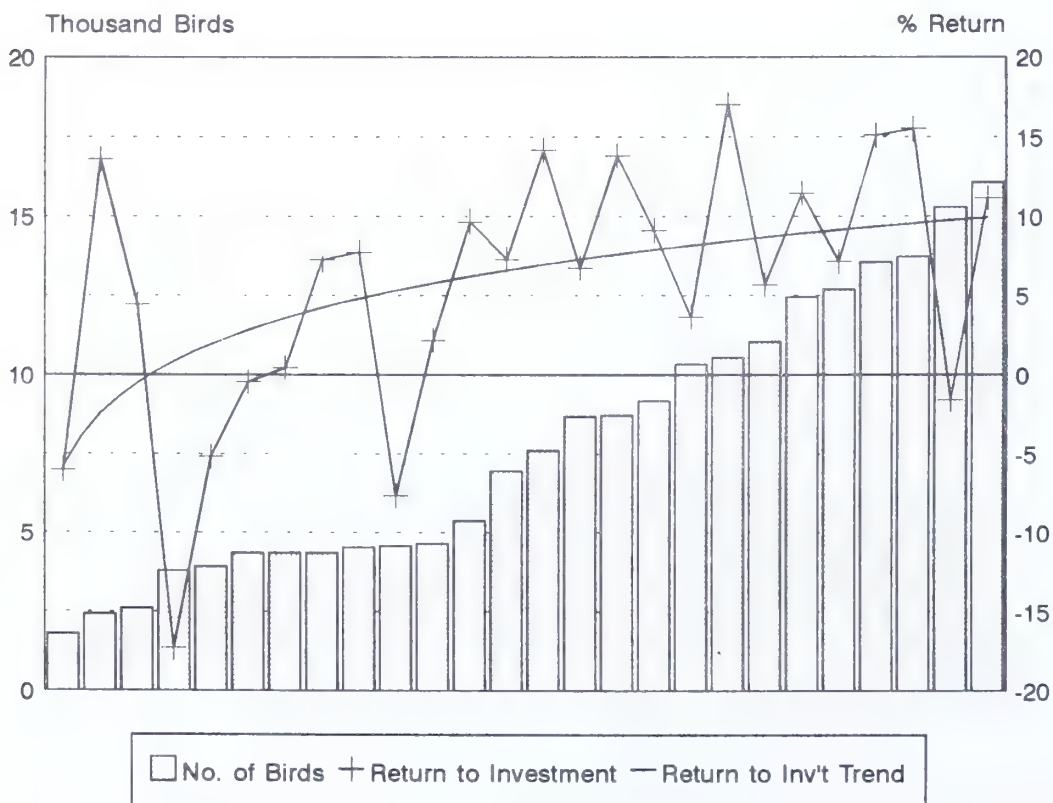


Size of Operation Versus Return to Investment

- Size of operation is represented by the bars (left-hand axis - thousand birds).
- Return to investment is represented by the jagged line and cross-marks (right-hand axis - % return).
- Table egg enterprises range from under 2000 birds to over 16,000 birds.
- The returns to investment are considerably more variable for the smaller operations than for the larger operations (over 5000 birds).
- The figure suggests that smaller operations (<5000 birds) recorded lower returns to investment, and that a slight upward trend (economy of scale) may be evident.
- However, the economic returns are much more consistent for the larger operations (flat trend line), which suggests that there is not a discernable economy of scale for operations between 5000 and 16,000 birds.

Figure 6

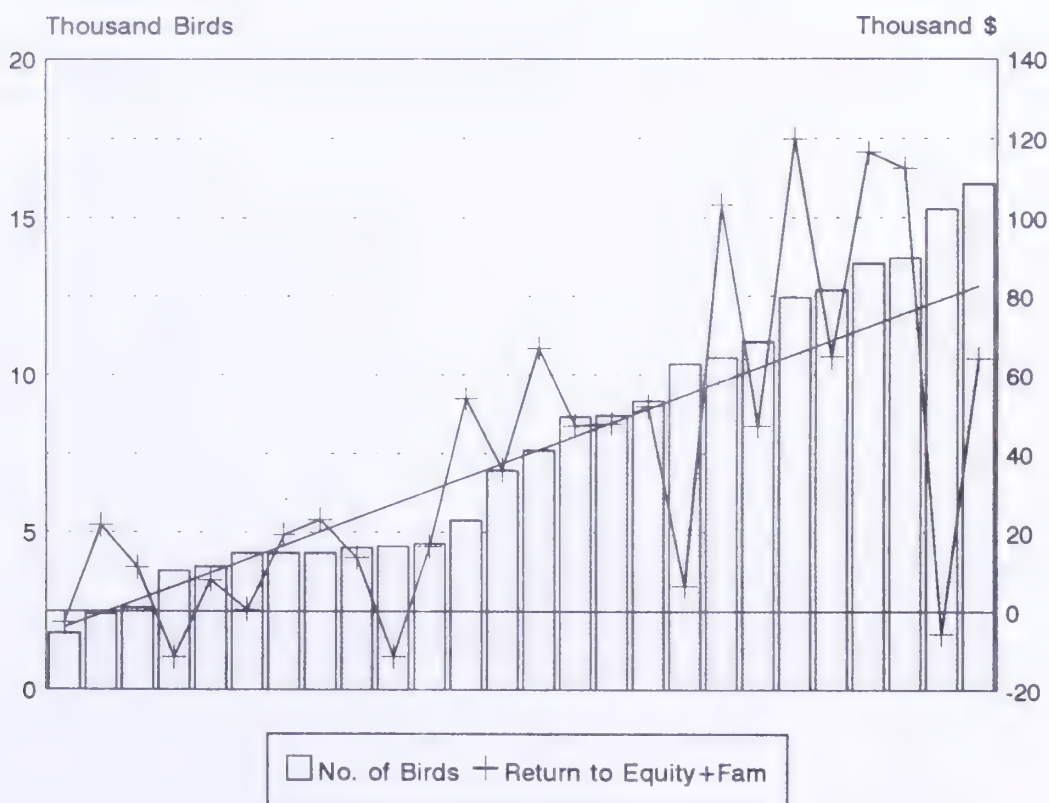
Size of Operation Vs. Return to Investment
1993



Size of Operation Versus Return to Equity+Family Labour

- This figure shows that the total financial returns to the table egg enterprise are directly proportional to the size of the operation (which is equivalent to saying the rate of return is constant, as shown in the previous figure).
- The figure suggests that operations of 7000 birds or more generate sufficient income to support a single family.
- Smaller operations generate smaller revenues, and therefore must be part of a mixed farm.
- Larger operations provide healthy returns.

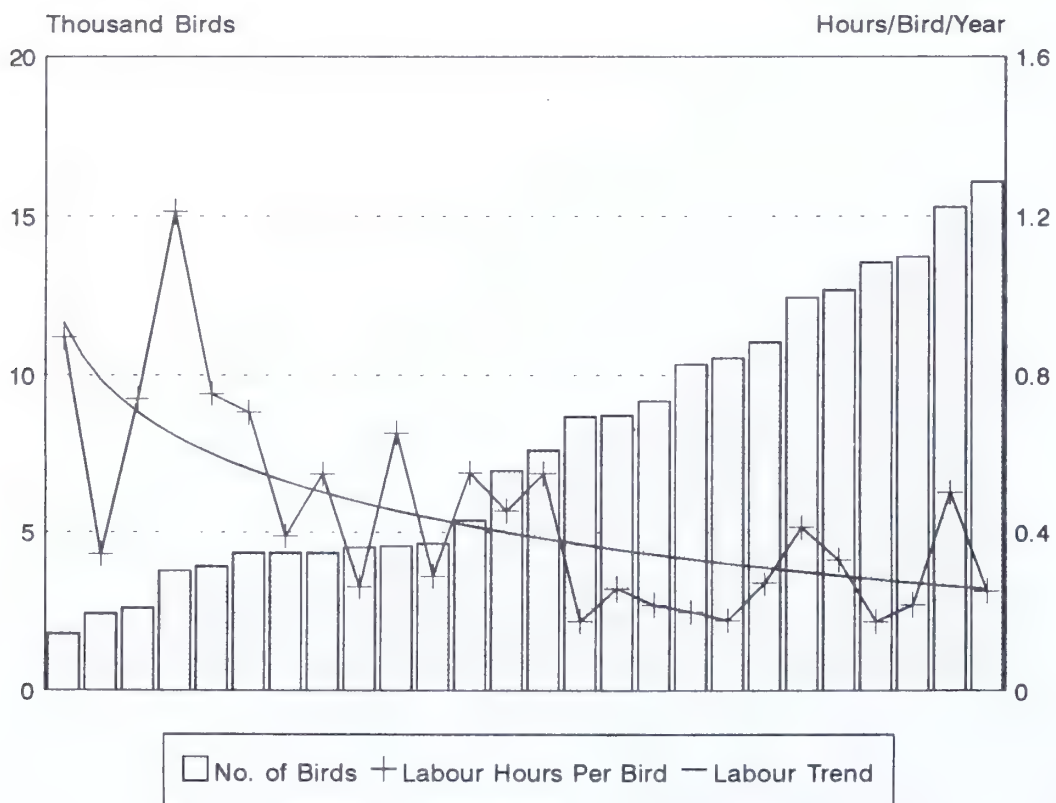
Figure 7 Size of Operation Vs. Return to Equity+Family Labour
1993



Size of Operation Versus Labour Hours Paid

- Labour requirements range from about 0.2 hours per bird per year to 1.2 hours per bird. The 1.2 hours per bird record is likely an outlier (i.e., an inaccurate estimate). The next highest is 0.9 hours per bird.
- Economies of scale can potentially be realized through either capital costs or variable costs.
- We expected that the labour requirements per bird would decline with the size of operation. That is, economies of scale exist with respect to labour.
- The figure shows that labour requirements tend to decline for the small to mid-sized operations, while remaining flat for the mid to large operations.
- This suggests that once a table egg operation has reached a certain size, on-farm labour efficiencies are fairly constant.

Figure 8 Size of Operation Vs. Labour Hours Per Bird
1993



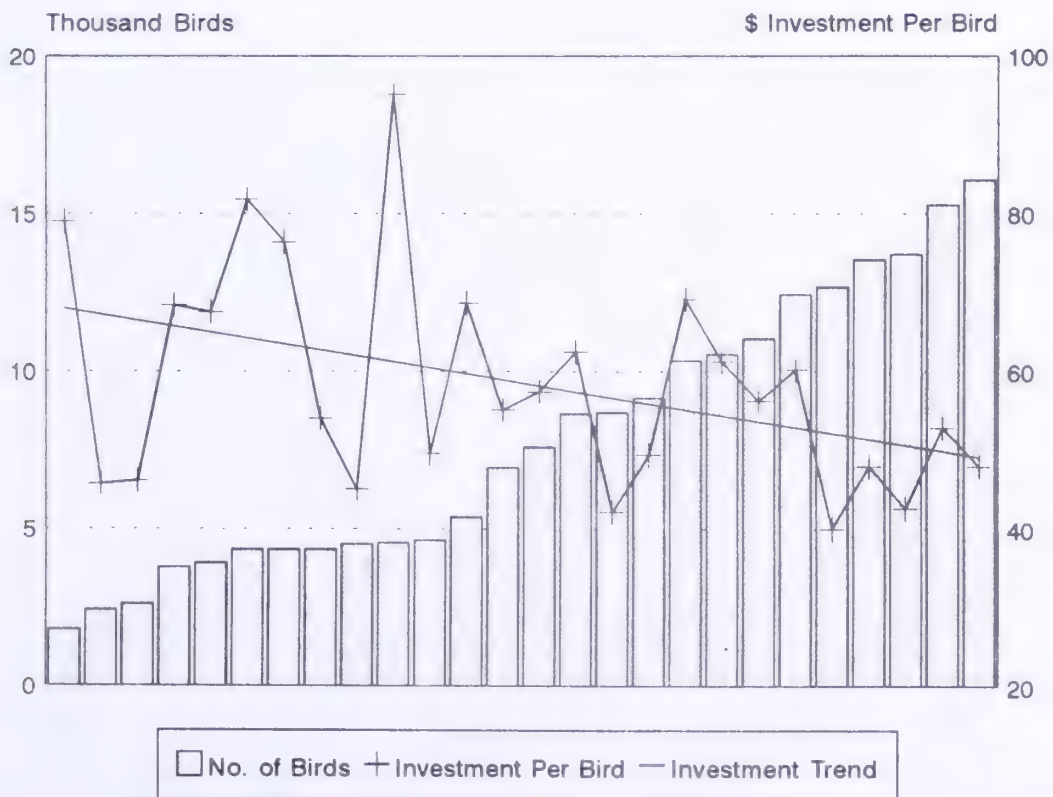
Size of Operation Versus Investment

The capital investment for buildings, equipment, machinery and quota ranges from just over \$40 per bird to \$95 per bird, however most are below \$80 per bird.

The figure suggests that as the size of the operation increases, economies of scale are realized as the investment per bird tends to decline.

As with most of the other variables, the smaller operations have a greater variability. They generally range between \$45 and \$80. The larger operations range between \$40 and \$60.

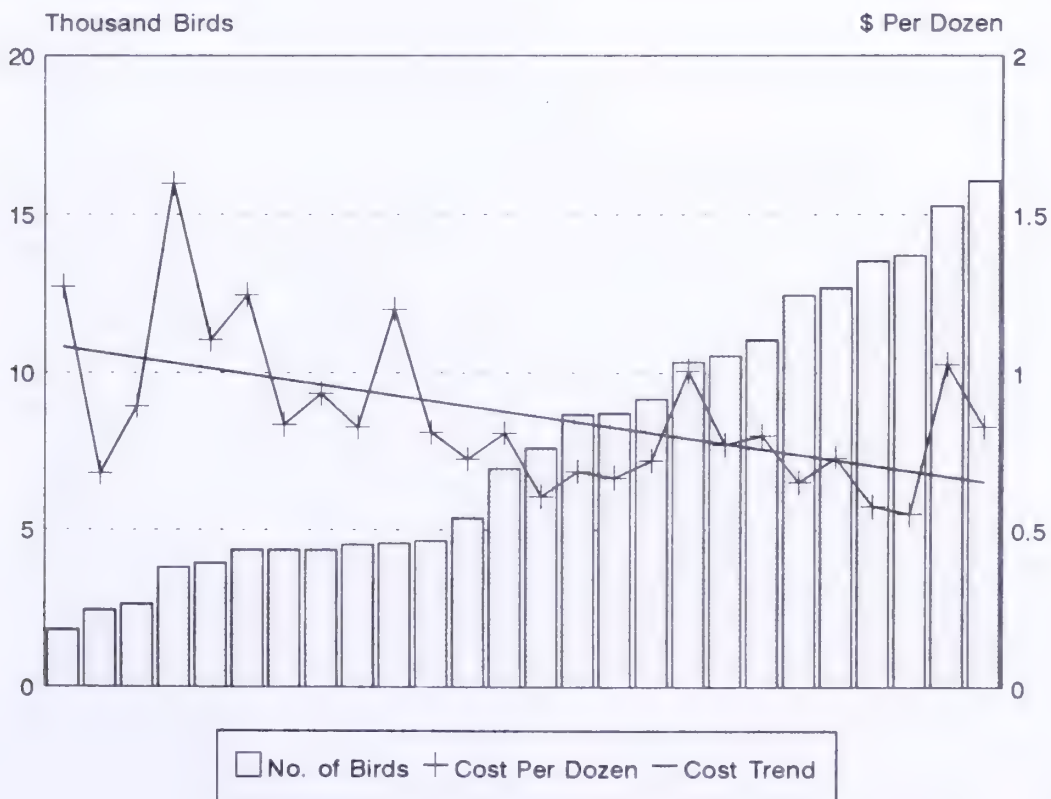
Figure 9 Size of Operation Vs. Investment
1993



Size of Operation Versus Total Cost Per Dozen

- The total production costs range from \$1.60 per dozen eggs to just over \$0.50 per dozen eggs. These costs represent variable plus fixed costs, including the imputed cost of unpaid family labour.
- This figure suggests that for smaller operations, total production costs tend to decline as the size of the operation increases.
- The chart does not indicate conclusively whether economies of scale exist with respect to total cost for operations over 5000 birds. A larger sample would be required to establish whether a trend exists.
- The smaller operations also demonstrate greater variability in costs.

Figure 10 Size of Operation Vs. Total Cost Per Dozen Eggs
1993

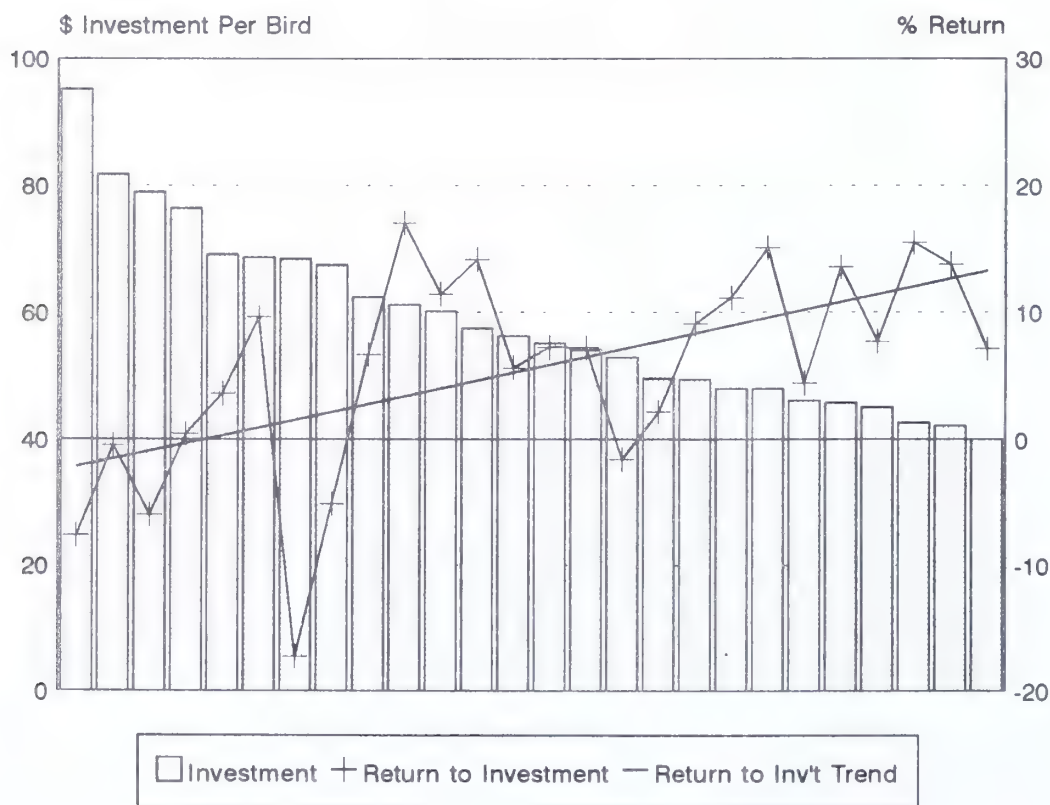


Investment Versus Return to Investment

- The following two charts relate investment (capitalization per bird) to other variables.
- Figure 11 relates unit investment to the rate of return to investment. Investments values (the bars) are ordered from largest to smallest and are read on the left-hand axis. As indicated in a previous figure, investments range from \$40 to \$90 per bird.
- As shown in Figure 6, the rates of return to investment range from -17% to +17%.
- Figure 11 suggests that as the level of investment per bird decreases, the rate of return to investment increases.
- One explanation for this may be that they are both affected by a common factor, the size of the operation. Higher investments per bird occur on smaller operations (as shown in figure 9). As operations grow in size, the capital investment requirement per bird tends to decline (economies of scale). In turn, the improved capital cost efficiency helps to improve the economic returns.
- Other possible explanations: a) depreciation costs on new equipment over-shadow increases in the rate of return, and b) some operations may become over-capitalized.

Figure 11

Investment Vs. Return to Investment
1993

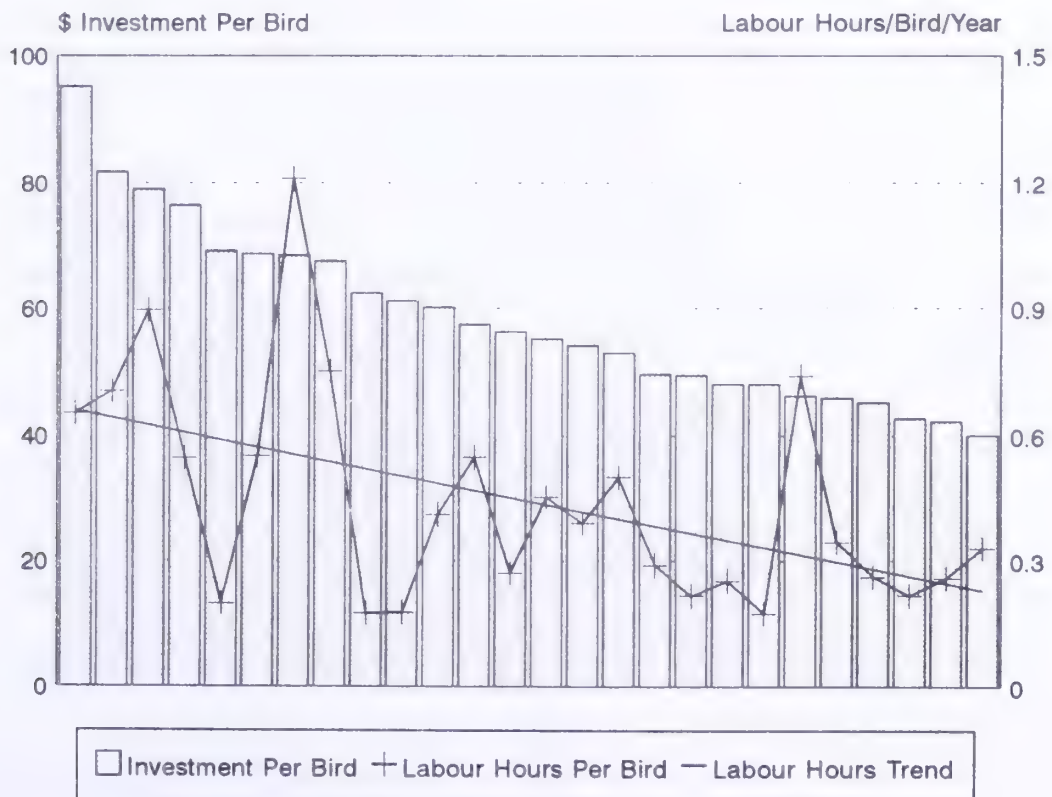


Investment Versus Labour Hours

- Figure 12 shows that labour hours per bird tend to decrease as the investment level per bird decreases.
- The same explanation provided for the previous Figure may apply here as well: that they are both affected by the size of the operation. Smaller operations tend to have higher capitalization requirements per bird (see Figure 9). As they become larger, economies of scale allow them to reduce the level of capital required per bird. Similarly, smaller operations tend to be more labour intensive on a per bird basis (Figure 8).

Figure 12

Investment Vs. Labour Hours
1993

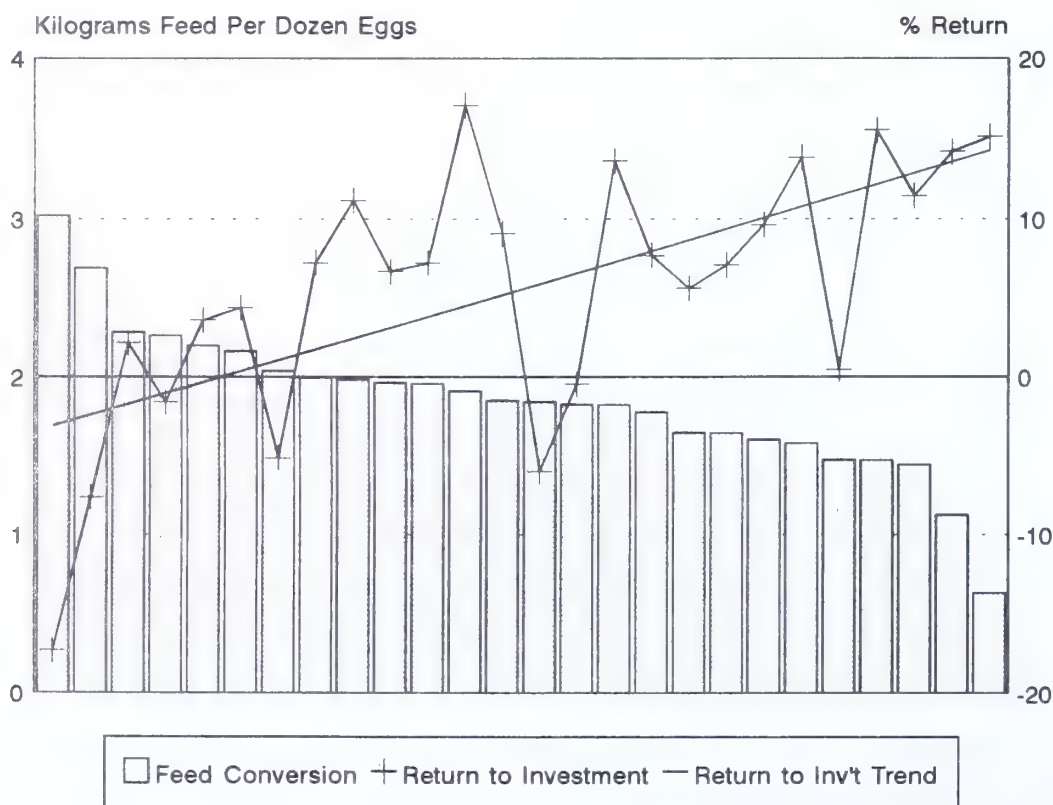


Feed Conversion Versus Return to Investment

- In this figure, feed conversion rates (the bars) are ordered from highest to lowest, and are read on the left-hand axis.
- Returns to investment (the line) are read on the right-hand axis.
- The figure demonstrates the inverse relationship between feed requirements (per dozen eggs) and profitability (rate of return to investment). As the feed conversion rates of producers improve (decline) from left to right, the rate of return also improves (rises).
- Generally, producers with a feed conversion rate of around 1.5 kilograms per dozen eggs recorded returns of about 10% to 15%, whereas producers with feed conversion rates of about 2.2 averaged returns of around 0%.

Figure 13

Feed Conversion Vs. Return to Investment
1993

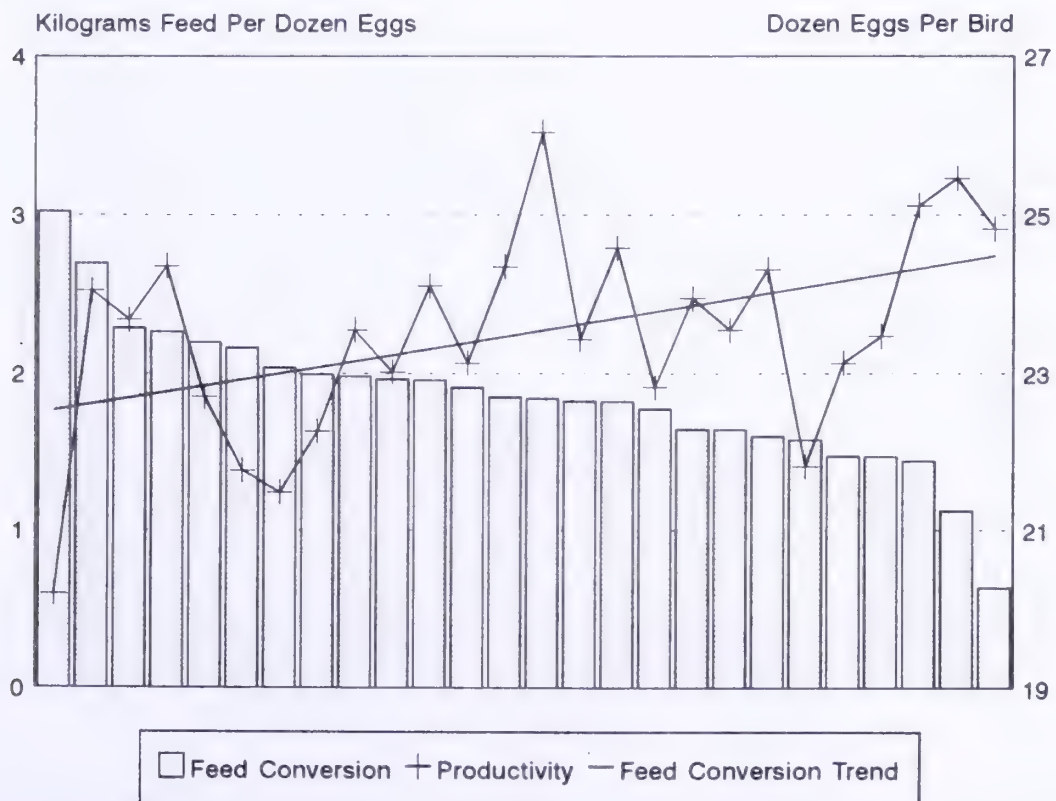


Feed Conversion Versus Productivity

- This figure demonstrates the inverse relationship between feed conversion rates and productivity.
- As the productivity per bird increases, the feed required per dozen eggs declines.

Figure 14

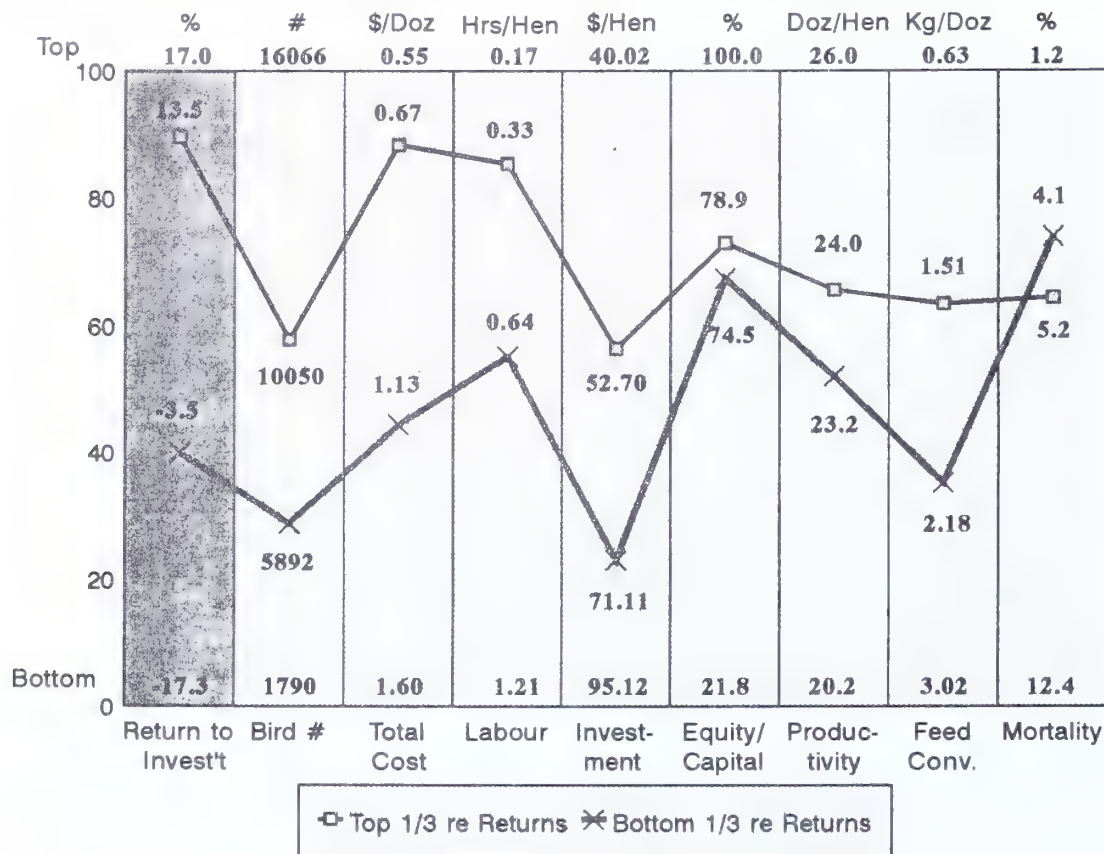
**Feed Conversion Vs. Productivity
1933**



Management Analysis - With Respect to Returns to Investment

- The following two figures provide another type of management analysis. The bar on the left shows the top third and the bottom third groups of sample producers with respect to return to investment. As well, the bar indicates the lowest and the highest returns to investment (i.e., the sample range).
 - The top third group averaged 13.5% return to investment.
 - The bottom third group averaged -3.5%.
 - The highest return was 17.0%.
 - The lowest return was -17.3%.
- The lines through the remaining bars show how the two groups performed in relation to other management factors. For instance, the top third with respect to return to investment also outperformed the lowest group in terms of total costs. The top third group averaged \$0.67 per dozen eggs whereas the bottom third group (with respect to returns to investment) averaged \$1.13.
- Overall, the top third group outperformed the bottom third group in terms of all the other management factors, with the exception of the mortality rate.

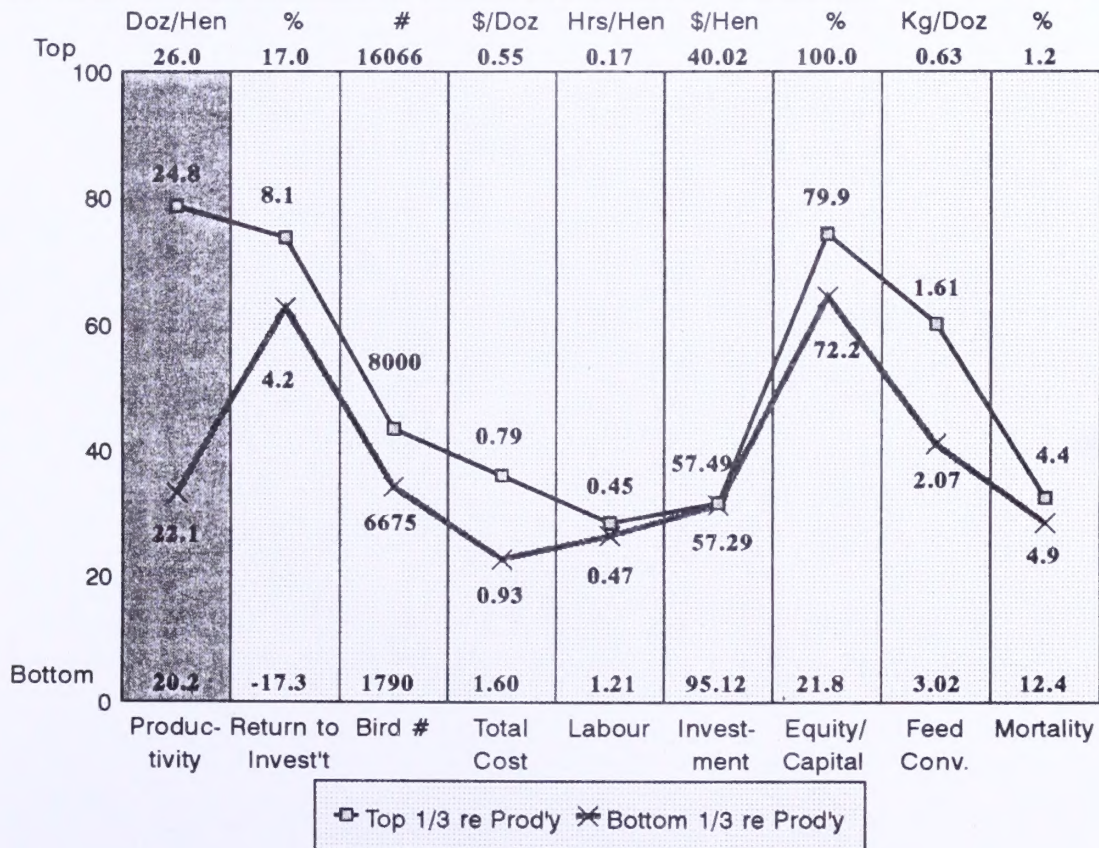
Figure 15 Top Third and Bottom Third Producer Groups With Respect to Return to Investment



Management Analysis - With Respect to Productivity

- The last figure is similar to Figure 15, however the two groups are based on performance regarding productivity rather than returns to investment.
 - The top third group averaged 24.8 dozen per hen.
 - The bottom third group averaged 22.1.
 - The highest return was 26.0.
 - The lowest return was 20.2.
- As with the previous figure, the top third producers here generally outperformed the bottom third producers in all management categories. The difference between the two groups, however, is much smaller, and perhaps not significant.

Figure 16 Top Third and Bottom Third Producer Groups With Respect to Productivity





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